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Carbapenemase-producing *Enterobacteriaceae*: a call for action!

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Since the beginning of this century, we have been observing increasingly rapid diffusion among *Enterobacteriaceae* of extended-spectrum β-lactamases (ESBLs), mostly of the CTX type and mostly in *Escherichia coli* [1]. This phenomenon has run out of control within just 10 years, and the outbreak is now internationally identified as being, in particular, a source of community-acquired infections.

In this context of multiresistance, the increasing number of carbapenemase-producing *Enterobacteriacae* is worrying, because carbapenems represent the last line of antibiotics that are still effective for treating many enterobacterial infections [2,3]. Although the hydrolytic profile of carbapenemases (mostly KPC, OXA-48, IMP, VIM, and NDM) is somewhat variable, all of them hydrolyse at least carbapenems [4–6]. The corresponding genes may be considered as markers of multidrug resistance—or even pandrug resistance—in specific areas in the world, as they are often found together with genes conferring resistance to most β-lactams, aminoglycosides, and fluoroquinolones. All of these genes are easily transferable within *Enterobacteriaceae*, because they are plasmid-borne.

If one considers the carbapenemase type and the host bacterial species, so far KPC, IMP and VIM seem to have been mostly identified in the main nosocomial pathogen, which is *Klebsiella pneumoniae* [4–6]. By contrast, in the case of carbapenemases of the NDM and OXA-48 types, both *K. pneumoniae* and *E. coli* can be regarded as sources of both nosocomial and community-acquired infections [4–6].

Identification of carbapenemase producers in *Enterobacteriacae* is becoming the major issue among antibiotic resistance problems worldwide, and in particular in Europe, for the following reasons:

- *Enterobacteriaceae* (*E. coli* in particular) are the source of the most frequent infections in humans, and the mortality rate is high.
- The number of carbapenemase producers is still limited in many countries in the world. Thus, controlling their spread in hospital settings is still both possible and worthwhile.
- The therapeutic possibilities for infections caused by carbapenemase producers are very limited [2,4]. Identification of the multidrug resistance pattern of these strains is therefore of primary importance.

The possibility of spread of carbapenemase producers is important. It will possibly mirror what has been extensively described for ESBL producers as a source of nosocomial infections since the 1980s. There are many reasons to believe that carbapenemase-expressing *K. pneumoniae* and *Enterobacter* spp. will act as the main source of nosocomial infections, as already reported in the case of ESBL producers. Screening of carriers is of fundamental importance, and should first be proposed for the most vulnerable patients such as immunocompromised patients and those hospitalized in units at high risk of colonization by multidrug-resistant bacteria (such as intensive-care units). In addition, it should be considered that carbapenemase-producing *E. coli* (mostly harbouring enzymes of the NDM and OXA-48 types) may spread at a lower rate but become rapidly uncontrollable in community settings, as observed for CTX-M producers among *E. coli*.

The present CMI issue is largely based on a conference sponsored by the ESCMID on carbapenemases held in Paris at the end of 2011. It will detail the spread of carbapenemase producers in Europe [7], summarize the current identification techniques and the methods for preventing their spread in hospital settings [8], and report infections and discuss therapeutic strategies [9]. We believe that these updates could be particularly useful for both clinical microbiologists and infectious diseases physicians, as carbapenem resistance is rapidly becoming the main antibiotic resistance issue worldwide.

Transparency Declaration

No conflicts of interest are declared.

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